

## FOOD CONTAINER WITH POP-OPEN LID

### Field of the Invention

This invention relates to containers and, more particularly, to food containers which are made from molded plastic and include a pop-open lid for easy opening.

### Background of the Invention

Food containers commonly used by restaurants and food packaging companies typically have a container body with side walls having a top rim and a lid having a bottom rim. The two are adapted to mate along their respective rims to form a watertight seal. They are commonly made in a simple molding process from plastic and, although reusable by the customer, are generally not returned to the restaurant.

Preferably, these containers must be reusable or resealable so that leftovers can be stored in the same container. The seal must be flexible enough to allow for easy opening and closing, yet tight enough to provide a secure seal against either leakage of food from the container or introduction of air and microbes into the container to prevent spoiling. Thus, there is a balance between providing a strong solid seal and a removable seal.

Generally, two types of these containers are employed, depending upon the amount of food to be stored. For heavy food items, such as an entire meal that may weigh two pounds or more, the seal between the container body and the lid needs to be very tight, to prevent the

weight of the food from forcing open the lid if the container is tilted or inverted. For smaller amounts of food or liquids, such as sauces, condiments and spices, which may weigh only a few ounces, an extremely tight seal is not required. In fact, it is a disadvantage. For example, soy sauce and similar containers in common use today in the take-out food industry are often sealed so tightly that a user must use two hands to force open the lid, and the force is often large enough to spill out the contents of the container prematurely. Thus, a need exists for a food container that is easily opened, preferably with only one hand, and preferably with only two fingers of one hand.

It is also important that both the container bodies and the lids be completely removable from each other and independently stackable, one on top of the other, to permit easy and low-cost bulk manufacture, packaging, shipping and storage.

Arrangements for closing and opening various types of containers are known. See, for example, U.S. Patent Nos. 6,460,716; 5,273,177; 4,805,790; and 1,850,606. These various arrangements, however, are generally intended either for non-food items such as shampoo, toothpaste or paint, or for relatively heavy food items.

#### Summary of the Invention

A unique sealing and opening arrangement has now been discovered for use with a plastic molded food container. Specifically, the invention comprises a molded plastic food container body or cup, open at the top, that is especially useful for holding sauces, condiments, spices and

the like. The invention also comprises a top lid or cap that is adapted to be mated with the container top, is completely removable from the container, is easily removed in a "pop-open" fashion with two fingers of one hand in a single motion, is reclosable, and which, in the fully closed position, provides a watertight seal for food or liquid contents within the container.

In a preferred embodiment, the container body and the lid each include a tab that protrudes outwardly from the container. Each tab includes a small inner protuberance on opposing faces thereof. When the lid is properly fitted onto the container body, the tabs line up, one above the other, so that the protuberances are forced into each other as the lid is closed. To open the lid, the user grasps one tab with a thumb and the other with a forefinger of the same hand, and squeezes the ends of the tabs together. This causes the tabs to operate as levers, with the protuberances acting as fulcrums. The lever action forces the lid up and away from the container body in a single motion.

Broadly, the plastic molded food container of the present invention can be characterized as comprising a plastic food container with a pop-open lid, comprising:

- a container body having a lower tab protruding outward from the body;

- a removable and reclosable lid adapted to fit over and seal the top of the body in a closed position, the lid having an upper tab protruding outward from the lid, aligning with the lower tab in the closed position;

- the lower and upper tabs including protrusions facing each other and arranged to contact each other in the closed position;

whereby, when outside edges of the upper and lower tabs are squeezed together by fingers of a user, the upper tab lifts the lid away from the body so as to open the container.

## BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects of the present invention may be more fully understood by reference to one or more of the following drawings, wherein:

FIG. 1 illustrates a perspective view of the container of the present invention, with the lid in a closed position;

FIG. 2 illustrates a perspective view of the container of the present invention, with the lid in an open position;

FIG. 3 illustrates a side external view of the container of the present invention, with the lid in a closed position;

FIG. 4 illustrates a side external view of the container of the present invention, with the lid in an open position;

FIG. 5 illustrates a side cutaway view of the container of the present invention, with the lid completely removed from the container; and

FIG. 6 illustrates a side cutaway view of the container of the present invention, with the lid in a closed position.

## Detailed Description of the Invention

In a preferred embodiment, and as best seen in FIGS. 2 and 5, the invention comprises a molded plastic cup or other hollow container body 10, comprising a base 30, side walls 40, a side

rim 52, a top rim 54, an inner rim 56, a ledge 58 and a lower tab 110, formed in a one-piece construction and having an open top. The container body is particularly useful for holding relatively small or light quantities of foods or liquids such as sauces, creams, dips, condiments, spices and the like.

In a feature of the invention, base 30 is preferably polygonal in shape. In this embodiment, the base forms an octagon when viewed from below, although any other polygonal shape may be used. The side walls 40 are flat near the base, are also arranged polygonally around the edges of the base, and meet along rigid edges 50. Near the top of the body, the side walls assume a smooth cylindrical shape, and the open top of the body is preferably circular or oval in shape when viewed from above. One purpose of the polygonal geometry of the base is to provide greater strength and rigidity for the base and walls than would otherwise be possible using a smooth cylindrical geometry along the entire length of the walls. This permits less material to be used in the manufacture of the body, thus saving costs.

The invention also includes a lid 20 that is adapted to be mated with the top of the container body when sealing of the container is desired. Lid 20 comprises a side portion 60, a top portion 70, a planar surface 80, an inner wall 75, a polygon structure 90 and an upper tab 100, formed in a one-piece construction of molded plastic. Side portion 60, top portion 70 and inner wall 75 together define a circular or oval channel 65 on the underside of the lid (FIG. 5) that is adapted to fit snugly over rims 52, 54 and 56 of body 10, so as to form sealing surfaces when the lid is mated with the body (FIG. 6). Lid 20 is completely removable from container body 10, as can be seen in FIG. 5.

Another feature of the invention is a unique opening mechanism and operation, described below. Starting first with the lid 20 in its preferred closed position, best shown in FIGS. 1, 3 and 6, it can be seen that upper tab 100 of the lid protrudes away from the lid and is aligned with the lower tab 110 of the container body. The top surface of upper tab 100 is flat, and the bottom surface of the upper tab has a protuberance 120 that is located approximately mid-way between the front of the upper tab (farthest from the lid) and the back of the upper tab.

Similarly, in the preferred closed position, lower tab 110 protrudes away from the container body and is aligned with the upper tab 100. The bottom surface of lower tab 110 is flat, and the top surface of the lower tab has a protuberance 130 that is located approximately mid-way between the front of the lower tab and the back of the lower tab.

Closing the lid is accomplished by a user pressing down on the lid. The operation of closing the lid goes through several steps. First, the user places the lid onto the top of the container body, in approximate alignment with the top. Then, the user presses down on the lid with a thumb or finger. The lid starts to slide down into alignment with the body toward the closed position. As best seen in FIGS. 1 and 3, when the lid is entering into a partially closed position, the protuberances 120 and 130 begin to touch each other. As the lid is pressed further into a fully closed position, the protuberances force the upper tab to rotate upward so that it projects outwardly from the lid at an upward angle when closure is complete.

The lower tab also has a protuberance on its top surface that is approximately mid-way between the front and back of the tab and positioned so as to come into contact with the protuberance on the upper tab when the cap is nearing the closed position. As the cap is pushed further down over the container and into the sealing channel, the two protuberances force the upper tab to bend upward slightly. As best shown in FIGS. 3 and 6, in the fully closed position, the two tabs take on a sideways-V-shaped appearance when the container is viewed from the side.

To open the container, the user simply squeezes the outside ends of the two tabs between the thumb and a finger of one hand. The squeezing force causes the tabs to operate as opposable levers, with the outside end of the upper tab rotating downward and the lower tab acting as a fixed support. With the protuberances acting as fulcrums, the inner neck end of the upper tab, being flexibly attached to the lid, rotates upward in reaction to the downward force of the thumb, so as to force the lid up and away from the container body. As the upper tab is further squeezed downward, the protuberance on the upper tab begins to slide toward the container body, which further increases the leveraging force applied upward to the lid. Before the ends of the tabs have been squeezed together, the leveraging force has exceeded the frictional sealing force between the lid and the container body, which was keeping the container closed. At this point, the lid “pops open” quickly. Thus, in one motion, using only two fingers of one hand, a user can pop open the lid. After popping open the lid, the user can then take away the lid using the same two fingers.

The lever action force supplied by the tabs is strong enough that even a child or elderly user can easily open the container in one motion using only two fingers of one hand. It is not necessary to grab the entire container with many fingers of both hands in order to open it.

In order to make the container bodies stackable, one on top of the other, base 30 is smaller in horizontal dimension than the top portion of body 10. In order to make the lids also stackable, independently of the bodies, the bottom edge of side portion 60 is wider than the top portion, so that the lids may fit one inside another.

Stacking ability for the container bodies is further enhanced by a plurality of levelers 59 (FIG. 5) spaced horizontally around the inside periphery of the body. In normal orientation, the bottom edge of each leveler is adapted to rest on the top of ledge 58. In this way, as another container body is placed on top of another container body, the tops of all stacked container bodies are kept horizontal, so as to maximize the number of container bodies that may be stacked together without the stack gradually tilting over to one side.

The polygonal shape of the container base is also advantageous in that it enables the base to fit snugly into the polygon structure 90 of the lid. The inner dimension of the base polygon is slightly less than the inner dimension of the lid polygon structure. This permits the user to secure the base onto the top of a lid, to help prevent the container body from spilling the food contents.



Container 10 and lid 20 are preferably made of plastic in a conventional way using conventional equipment. Good results have been obtained by injection molding. The container has a thin wall, suitably about 0.5 mm or less thick.

It will be understood that the claims are intended to cover all changes and modifications of the preferred embodiments of the invention herein chosen for the purpose of illustration which do not constitute a departure from the spirit and scope of the invention.